

Amendments to the Claims

1. (currently amended) A hollow nanocrystal, comprising: a nanocrystal shell having a thickness of at least 0.5 nm, said nanocrystal shell enveloping an empty space and lacking a core, wherein, said nanocrystal shell is not ~~perfectly single crystalline~~ comprised of discrete molecular sheets.
2. (original) The hollow nanocrystal as claimed in claim 1, wherein:
the shell thickness is between about .5 nm and 100 nm.
3. (original) The hollow nanocrystal as claimed in claim 2, wherein:
the shell thickness is between about 2 nm and 80 nm.
4. (original) The hollow nanocrystal as claimed in claim 3, wherein:
the shell thickness is between about 3 nm and 10 nm.
5. (original) The hollow nanocrystal as claimed in claim 1, wherein:
the shell comprises a material selected from the group consisting of Pt, ZnS, ZnSe, ZnTe, ZnO, CoO, Co₃O₄, Fe₂O₃, FeP, Fe₃O₄, FeO, TiO₂, CdS, CdSe, CdTe, HgS, HgSe, HgTe, MgTe, GaN, GaP, GaAs, GaSb, InN, InP, InAs, InSb, AlAs, AlP, AlSb, AlS, Co₉S₈, Co₃S₄, CoSe, GaMnAs, GaInN and InAsN.
6. (original) The hollow nanocrystal as claimed in claim 1, wherein:
the shell comprises a material selected from the group consisting of Co₉S₈, Co₃S₄, CoO, Co₃O₄, CoSe, CdS, Fe₂O₃, CdSe and Pt.
7. (original) The hollow nanocrystal as claimed in claim 5, wherein:
the shape of the hollow nanocrystal is either spherical, branched, tubular or disk.
8. (original) The hollow nanocrystal as claimed in claim 7, wherein:

the shape of the nanocrystal is spherical, and the outside diameter is between about 1 nm and 1000 nm.

9. (original) The hollow nanocrystal as claimed in claim 8, wherein:

the outside diameter is between 1 nm and 500 nm.

10. (original) The hollow nanocrystal as claimed in claim 9, wherein:

the outside diameter is between 5 nm and 100 nm.

11. (original) The hollow nanocrystal as claimed in claim 10, wherein:

the outside diameter is between 10 nm and 50 nm.

12. (original) The hollow nanocrystal as claimed in claim 11, wherein:

the outside diameter is between 10 nm and 30 nm.

13. (original) The hollow nanocrystal as claimed in claim 1, wherein:

the hollow nanocrystal shell comprises a binary or ternary compound, wherein said binary and/or ternary compound comprises a first material and a second material, wherein:

the first material comprises a material selected from the group consisting of Pt, Zn, Co, Fe, Ti, Cd, Hg, Mg, Ga, In, Al, Ni, Sn and Bi; and the second material is selected from the group consisting of S, Se, O, P, N, F, Cl, I, Br, As and Sb.

14. (original) The hollow nanocrystal as claimed in claim 13, wherein:

the diffusion rate for the first material is different than the diffusion rate for the second material.

15. (original) The hollow nanocrystal as claimed in claim 7, wherein:

the nanocrystal has a disk shape, and the outside diameter is between about 10 nm to about 200 nm.

16. (original) The hollow nanocrystal as claimed in claim 15, wherein:

- the outside diameter is between about 10 nm and 100 nm.
17. (original) The hollow nanocrystal as claimed in claim 15, wherein:
the outside diameter is between about 25 nm and 50 nm.
18. (original) The hollow nanocrystal as claimed in claim 7, wherein:
the nanocrystal has a tubular shape, and the length is between about 30 nm to about 500 μm .
19. (original) The hollow nanocrystal as claimed in claim 18, wherein:
the length is between about 50 nm and 200 μm .
20. (original) The hollow nanocrystal as claimed in claim 19, wherein:
the length is between about 50 nm and 20 μm .
21. (currently amended) A method of making a hollow nanocrystal, comprising
providing a nanocrystal comprising a first material,
reacting the nanocrystal with a second material,
wherein the first and second material react to form a shell of a hollow nanocrystal that is not comprised of discrete molecular sheets, and wherein said hollow nanocrystal shell enveloping an empty space and lacking a core.
22. (original) A method of making a hollow nanocrystal as claimed in claim 21, wherein: the first material comprises a material chosen from the group consisting of Al, Ga, In, Tl, Sn, Pb, Bi, Po, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Y, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, La, Hf, Ta, W, Re, Os, Ir, Pt, Au, Hg, Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr, Ba, Ge, Si, Se, Te, FeCo, CoNi and CdZn.

23. (original) A method of making a hollow nanocrystal as claimed in claim 21, wherein: the second material comprises a material chosen from the group consisting of S, O, Se, Te, P, N, As, Cl, I, Br and Bi.
24. (original) A method of making a hollow nanocrystal as claimed in claim 23, wherein: the second material comprises a material chosen from the group consisting of S, O, Se and Te.
25. (original) A method of making a hollow nanocrystal as claimed in claim 21, wherein: the second material comprises sulfur in solution, and the second material is combined with a solution containing the first material to make a sulfide hollow nanocrystal.
26. (original) A method of making a hollow nanocrystal as claimed in claim 21, wherein: the second material comprises O, and a gaseous mixture containing the second material is combined with a solution containing the first material, thereby making a oxide hollow nanocrystal compound.
27. (original) A method of making a hollow nanocrystal as claimed in claim 21, wherein: the second material comprises O, and and the second material is in solution and is combined with a solution containing the first material, thereby making an oxide hollow nanocrystal compound.
28. (new) A method of making a hollow nanocrystal as claimed in claim 21, wherein a substantial fraction of the first material reacts with the second material to form a shell of a hollow nanocrystal.
29. (new) A method of making a hollow nanocrystal as claimed in claim 21, wherein the first material reacts with the second material to form a shell of a hollow nanocrystal in a single step reaction.
30. (new) A method of making a hollow nanocrystal, comprising:

providing a nanocrystal comprising a first material,
reacting the nanocrystal with a second material,
wherein a substantial fraction of the first material reacts with the second material to form a shell of a hollow nanocrystal in a single step without additional material removal steps, and wherein said hollow nanocrystal shell enveloping an empty void or multiple voids.

31. (new) The method as claimed in claim 30, wherein the first material comprises a material selected from the group consisting of Pt, Zn, Co, Fe, Ti, Cd, Hg, Mg, Ga, In, Al, Ni, Sn and Bi; and the second material is selected from the group consisting of S, Se, O, P, N, F, Cl, I, Br, As and Sb.

32. (new) The method as claimed in claim 30, wherein the hollow nanocrystal shell formed comprises a binary or ternary compound, wherein said binary and/or ternary compound comprises the first material and the second material.

32. (new) A hollow nanocrystal made by the method of Claim 21 comprising a nanocrystal shell of at least 0.5 nm thickness, said nanocrystal shell enveloping a void or multiple voids, wherein said nanocrystal shell is not comprised of discrete molecular sheets.